

Claims

[1] L A loading and unloading stand of a palletless rack type storage system comprised of a plurality of racks having a loading fork and a stacker crane for loading cargo onto or unloading from the rack, and the stacker crane having a transfer fork arranged in a right angle to the loading fork, the transfer fork moving up or down in respect to the loading fork, the loading and unloading stand comprising:
plural fork bars arranged lengthwise with an interval to each other; longitudinal beam arranged in a right angle against the fork bar, and supporting below the fork bar, so that at least one free end of the fork bar takes a form of cantilever, and fixedly mounting each fork bar on the rack; plural rollers being arranged in a proper interval in the fork bar and the roller rotation center arranged along a width of the fork bar, the upper portion of the roller having an excessive protrusion above the top of the fork bar so as to allow wheels of the cargo to be rolling-contacted; and a drive unit to keep the rollers rolling in the loading or unloading direction of the cargo, in which the loading/unloading stand providing at a rim near the entrance of an predetermined floor of the rack and being a same level as the loading and unloading conveyor to load cargo into the rack from a loading station, or unload cargo to an unloading station from the rack.

2. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the fork bar has approximate U shape body, and plural support plates placed between each longitudinal wall of the body for rotationally supporting the roller.

3. The loading/unloading stand of a palletless rack type storage system according to claim 2, wherein: plural foreign substance outlets are formed at the floor of the fork bar.

4. The loading/unloading stand of a palletless rack type storage system according to claim 2, wherein: a cover is further provided on the top of the fork bar so as to prevent the entry of the foreign substance.

5. The loading/unloading stand of a palletless rack type storage system according to claim 2, wherein: plural foreign substance outlets are formed at the floor of the fork bar and a cover is provided on the top of the fork bar so as to prevent the entry of the foreign substance.

6. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: an upper portion of a support hole formed at the support plate is left open, and the support hole supports a shaft of the roller.

7. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the fork bar is comprised of two parallel longitudinal walls and plural support plates placed at a right angle between each longitudinal wall for rotationally supporting the roller.
8. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the fork bar is a rectangular shape body, and a support plate is uprightly placed on the top plate of the body for supporting the roller.
9. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the fork bar is comprised of a rectangular body having a body opening at the top plate of the body, and a container-shape roller housing for accommodating the roller.
10. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the longitudinal beam is comprised of a first longitudinal beam for supporting one end of the fork bar and a second longitudinal beam for supporting middle portion of the fork bar, in which the transfer fork approaches toward only one lateral side of the stand.
11. The loading/unloading stand of a palletless rack type storage system according to claim 10, wherein: multiple rollers arranged at each fork bar at a regular interval form roller row, and neighboring shaft of each roller is drivingly coupled.
12. The loading/unloading stand of a palletless rack type storage system according to claim 11, wherein: a part of the rollers is arranged along a direction of loading/unloading of cargo in a certain interval, and is connected to the drive unit so it can rotate the roller, and the connected rollers act as driving rollers.
13. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: each longitudinal beam support each end of the fork bar, where the respective supporting point is a distance from each end of the fork bar toward the middle of the fork bar, and the respective ends of each longitudinal beam are connected with a post, the transfer beam approaches both lateral sides of the stand, and the roller is comprised of a first roller and a second roller bordered at a center of the fork bar and being drivingly coupled, and the first roller is isolated from the second roller so as to individually support respective bottom of each cargo.
14. The loading/unloading stand of a palletless rack type storage system according to claim 13, wherein: the first and second roller is comprised of roller row having multiple rollers arranged at each fork bar at a regular interval, neighboring shaft of each roller is drivingly coupled.
15. The loading/unloading stand of a palletless rack type storage system

according to claim 1, wherein: the drive unit is comprised of a drive pulley arranged in a predetermined interval below the fork bar having the roller row, a driven pulley provided at a shaft of the roller, a first drive belt coupling with neighboring drive pulley, a second drive belt connecting with the corresponding drive pulley and driven pulley, and a motor for giving rotation to one of any drive pulleys.

16. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: a projection tab is provided at the lower middle portion of the fork bar with a proper height and is connected with each longitudinal beam.

17. The loading/unloading stand of a palletless rack type storage system according to claim 1, wherein: the stand is further comprised of a stopper that is comprised to stop the cargo running on the fork bar at a predetermined position.

18. The loading/unloading stand of a palletless rack type storage system according to claim 17, wherein: the stopper is a limit switch that is attached on a supporter between the cargo and the post and the supporter being uprighted from the longitudinal beam, by which the motor stops when the cargo has in contact with the limit switch.

19. The loading/unloading stand of a palletless rack type storage system according to claim 17, wherein: the stopper is a distance sensor that is attached on a post, by which the distance of the approaching cargo is detected to the drive unit.

20. The loading/unloading stand of a palletless rack type storage system according to claim 17, wherein: the stand is further comprised of a weight sensor that is installed at the lower portion of the longitudinal beam, by which the deflection of the longitudinal beam caused by the overweight cargo is measured, and a denial signal for overweight cargo is generated.